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ACUTE EFFECTS OF GLUCAGON ON SPONTANEOUS RHYTHMIC CONTRACTIONS OF THE RAT URINARY BLADDER.

Aims of Study

Previous studies indicate that bladder instability may be associated with increased spontaneous rhythmic contractile (SRC) activity. In the eary stage of diabetes millitus (DM), overactive bladder is frequnetly seen. Considering these facts, we investigated the effects of glucagon (protein kinase A [PKA] inhibitor) on the bladder function by acute administration in vivo and in vitro

Methods

Male Wistar rats of 16 weeks old were administered at a dose of 10mM glucagon 2 days before sacrifice. Micutriton behavior of glucagon-treated rats was remarkably reduced in number and volume (nearly urinary retension). We measured the whole bladder weight and recorded the isometric force of muscle strip in the organ bath.

Results

Compared to the control rats, glucagon-treated rats showed significant increase in the magnitude of SRC. The SRC did not abolish by adding H-7 (protein kinasw C [PKC] inhbitor). By adding glucagon to control bladder muscle strips in the organ bath, SRC was signifcantly reduced. To the muscarine stimulation using 10μM carbachol, glucagon-treated rats showed weaker contraction than control.

Conclusions

Ca2+ influx plays a central role in smooth muscle contractions. PKA caused inhibitory effects on muscle contraction. However, acute administration of glucagon in vivo caused nearly urinary retension, and compensatry muscle overactivity was observed. These results may indicate in the early stage of DM, bladder showed overactivity with impared contraction.

References

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